

REMARKS

Currently, claims 2-4, 7-13, 15-17, 19, 21, and 22 are pending in the present application. Claims 15-17 are presently withdrawn.

Claim Rejections – 35 U.S.C. § 103

In the Office Action, independent claim 21 was rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,792,532 to Pfleger in view of U.S. Patent No. 5,451,624 to Memon.

Pfleger is cited in the Office Action as disclosing an embodiment that “comprises an outer layer of polyamide elastomer and an inner layer of polyoxymethylene (POM) copolymer.” As correctly noted in the Office Action, the **only** mention of POM is in claim 30. Claim 30 of Pfleger depends upon claim 8 which requires “at least one intermediate layer” between the inner and outer layers. Pfleger discloses the reasoning behind the need of intermediate layers in some embodiments: “Embodiments with layers of polymers which have an unsatisfactory compatibility with each other advantageously contain an interim layer of polymers which are compatible with those of the adjoining layers.” Col. 3, lines 56-60.

In stark contrast, Applicants disclose and claim directly molding the thermoplastic polyamide component onto a polyacetal molding (i.e., the layers are in direct contact with one another with no intervening layers). As disclosed by Applicants, polyacetals are difficult to adhere to with many components. As such, the embodiment disclosed in Pfleger requiring an intervening layer between the POM and polyamide layers is to be expected. In an attempt to expedite prosecution, Applicants have closed the language of independent claim 21 requiring the composite to consist of the polyacetal component

and the thermoplastic polyamide component. Applicants submit that Memon fails to remedy the deficiencies of Pfleger and respectfully requests withdrawal of the rejection.

Also in the Office Action, independent claim 21 was rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 6,517,949 to Mutsuda in view of Memon. Mutsuda discloses a composite of a polyacetal resin directly adhered to a thermoplastic resin or elastomer having an acidic group. Among a laundry list of “possible” thermoplastic resins or elastomers disclosed, Mutsuda discloses “polyamide-based thermoplastic elastomers” may be used. The acidic group that the thermoplastic resin or elastomer has been modified with includes a carboxyl groups and carboxylic anhydride groups or the addition to the compound of a comonomer of acrylic acid, methacrylic acid, fumaric acid, maleic acid, maleic anhydride, or itaconic acid. Col. 1, lines 55-62.

Applicants disclose the difficulty encountered in the art with adhesion of various components to polyacetals. Indeed, Mutsuda discloses such difficulties and requires the modification of the thermoplastic resins with specific acids in order to achieve compatibility. A look to the examples of Mutsuda illustrates the criticality of the selection of the various additives to the thermoplastic resin to achieve adhesion (i.e., thermoplastic components B5-B8 would not adhere to the polyacetal). Importantly, Mutsuda includes no disclosure of any actual embodiments of polyacetals adhered to polyamide components.

Of note, Applicants disclose various references in the specification that, like Mutsuda, include a large list of “possible” components, but no embodiments teaching Applicants’ claimed components. As disclosed in the specification and throughout the

art, the production of bonding between polyacetals (e.g., POM) and thermoplastic elastomers is problematic. The absence of specific examples of POM and TPEA bonding in the prior art is noteworthy as those skilled in the art appreciate the inherent adhesion difficulties.

Furthermore, Applicants require applying the thermoplastic polyamide elastomer component to the polyacetal molding at a melt temperature from 200 to 320°C (claim 21) and particularly from 220 to 280°C (claim 22). The criticality of the temperature of the thermoplastic polyamide elastomer melt is illustrated in the Examples in which, in one embodiment, the polyamide elastomer failed to adhere to the polyacetal. In contrast to Applicants claims, Mutsuda requires the heating temperatures of the components prior to adhesion to be from 120°C to 200°C. Col. 5, line 13.

Additionally, it is noted that Applicants' claims 8-12 further limit the polyamide elastomer. In particular, claim 9 requires a specific structure of a copolyamide and claims 11 and 12 require specific polyetheramide elastomer components, none of which include a carboxyl or carboxylic acid anhydride acid group as required by Mutsuda. In an attempt to obviate these limitations, the Office Action points to U.S. Patent No. 4,376,856 to Tanaka as obviating such limitations. Applicants respectfully disagree.

While Tanaka discusses a polyether-ester amide with good impact resistance properties, Tanaka makes no mention of the adhesion capability of such a compound with polyacetals. Furthermore, and importantly, Tanaka fails to disclose or suggest incorporating an acid group of carboxyl or carboxylic acid anhydride into the component. Thus, one skilled in the art would not seek to modify Mutsuda in the manner suggested. The polyether-ester amide of Tanaka does not meet the strict limitations of the

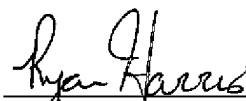
thermoplastic resin required in Mutsuda and indicated as a requirement in Mutsuda to achieve satisfactory adhesion with the polyacetal resin. Based on the disclosure of Mutsuda, one skilled in the art would have no reasoning or suggestion to believe that the polyamide of Tanaka would form a suitable adhesive bond with polyacetal considering the polyamide of Tanaka does not include the limitations found necessary by the inventors in Mutsuda "after intensive investigations." Col. 1, line 45.

Thus, it is believed that the present application is in complete condition for allowance and favorable action is respectfully requested. Examiner Freeman is invited and encouraged to telephone the undersigned, however, should any issues remain after consideration of this Amendment.

Please charge any fees required by this Amendment to Deposit Account No. 04-1403.

Respectfully submitted,

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Date: 5/3/10